

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : C07K 14/16, C12N 15/49, 15/67, A61K 48/00		A3	(11) International Publication Number: WO 98/34640 (43) International Publication Date: 13 August 1998 (13.08.98)
(21) International Application Number: PCT/US98/02293 (22) International Filing Date: 3 February 1998 (03.02.98)		(81) Designated States: AL, AM, AU, AZ, BA, BB, BG, BR, BY, CA, CN, CU, CZ, EE, GE, GW, HU, ID, IL, IS, JP, KG, KR, KZ, LC, LK, LR, LT, LV, MD, MG, MK, MN, MX, NO, NZ, PL, RO, RU, SG, SI, SK, SL, TJ, TM, TR, TT, UA, US, UZ, VN, YU, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).	
(30) Priority Data: 60/037,854 7 February 1997 (07.02.97) US 97/05040.5 12 March 1997 (12.03.97) GB		(Published) <i>With international search report.</i>	
(71) Applicant (<i>for all designated States except US</i>): MERCK & CO., INC. [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065 (US). (72) Inventors; and (75) Inventors/Applicants (<i>for US only</i>): SHIVER, John, W., Jr. [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065 (US). DAVIES, Mary-Ellen, M. [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065 (US). FREED, Daniel, C. [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065 (US). LIU, Margaret, A. [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065 (US). PERRY, Helen, C. [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065 (US).		(88) Date of publication of the international search report: 19 November 1998 (19.11.98)	
(74) Common Representative: MERCK & CO., INC.; 126 East Lincoln Avenue, Rahway, NJ 07065 (US).			
(54) Title: SYNTHETIC HIV GAG GENES			
(57) Abstract			
<p>Synthetic DNA molecules encoding HIV gag and modifications of HIV gag are provided. The codons of the synthetic molecules are codons preferred by the projected host cell. The synthetic molecules may be used as a polynucleotide vaccine which provides effective immunoprophylaxis against HIV infection through stimulation of neutralizing antibody and cell-mediated immunity.</p>			

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	IS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

INTERNATIONAL SEARCH REPORT

Int'l Application No

PCT/US 98/02293

A. CLASSIFICATION OF SUBJECT MATTER			
IPC 6	C07K14/16	C12N15/49	C12N15/67
			A61K48/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 09378 A (THE GENERAL HOSPITAL CORP) 28 March 1996 see page 1 - page 26 see page 41	1-3, 5, 10-12
Y	---	4, 6-9
X	HAAS J ET AL: "CODON USAGE LIMITATION IN THE EXPRESSION OF HIV-1 ENVELOPE GLYCOPROTEIN" CURRENT BIOLOGY, vol. 6, no. 3, 1 March 1996, GB, pages 315-324, XP000619599 see the whole document	1-3, 5, 10-12
	---	-/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
13 August 1998	27/08/1998
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3018	Authorized officer De Kok, A

INTERNATIONAL SEARCH REPORT

Int'l. Application No.
PCT/US 98/02293

C(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 94 16737 A (WEINER DAVID B ET AL) 4 August 1994 see page 2 - page 5 see page 14, line 29 - page 16, line 18 see page 32, line 25 - page 48, line 31 see page 94 - page 97	6-9
A	---	1,2,5
A	WO 91 09869 A (MEDICAL RESEARCH COUNCIL) 11 July 1991 see the whole document	1-3,5,6, 8-12
A	EP 0 565 794 A (BRITISH BIO-TECHNOLOGY) 20 October 1993 see column 1 - column 17	1-3,5-12
Y	EP 0 345 242 A (SMITHKLINE BIOLOGICALS) 6 December 1989 see the whole document	4
A	LIU M A ET AL: "Vaccination of mice and nonhuman primates using HIV-gene-containing DNA" ANTIBIOTICS AND CHEMOTHERAPY, vol. 48, 1996, BASEL CH, pages 100-104, XP002073766 see the whole document	1-12
P,X	WO 97 11086 A (THE GENERAL HOSPITAL CORP) 27 March 1997 see page 1 - page 20 see page 44	1-3,5, 10-12
P,X	WO 97 31115 A (MERCK & CO INC) 28 August 1997 see the whole document	1-3,5-12
P,X	ANDRE S ET AL: "Increased immune response elicited by DNA vaccination with a synthetic gp120 sequence with optimized codon usage" JOURNAL OF VIROLOGY., vol. 72, no. 2, February 1998, NEW YORK US, pages 1497-1503, XP002073767 see the whole document	1-3,5-12
E	WO 98 12207 A (THE GENERAL HOSPITAL CORP) 26 March 1998 see page 1 - page 2 see page 3, line 20 - line 23 see page 5, line 20 - page 6, line 3 see page 10, line 18 - page 21, line 18 see claims 1-4	1-3,5, 10-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/02293

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 9609378	A	28-03-1996	US	5786464 A	28-07-1998
			AU	3509995 A	09-04-1996
			CA	2200342 A	28-03-1996
			EP	0781329 A	02-07-1997
			JP	10506278 T	23-06-1998

WO 9416737	A	04-08-1994	US	5593972 A	14-01-1997
			AU	675702 B	13-02-1997
			AU	6232094 A	15-08-1994
			EP	0681483 A	15-11-1995
			HU	73099 A	28-06-1996
			JP	8509694 T	15-10-1996
			ZA	9400493 A	03-01-1995

WO 9109869	A	11-07-1991	CA	2072351 A	06-07-1991
			EP	0510054 A	28-10-1992
			GB	2255093 A, B	28-10-1992
			GB	2273709 A, B	29-06-1994
			GB	2273710 A, B	29-06-1994
			US	5700469 A	23-12-1997
			US	5480967 A	02-01-1996

EP 0565794	A	20-10-1993	AU	2462392 A	18-11-1993
			AU	4076393 A	18-11-1993
			CA	2118026 A	28-10-1993
			WO	9320840 A	28-10-1993
			WO	9321332 A	28-10-1993
			JP	7505412 T	15-06-1995
			NZ	244126 A	22-12-1994
			ZA	9206340 A	21-02-1994
			ZA	9302624 A	25-10-1993

EP 0345242	A	06-12-1989	AP	129 A	17-04-1991
			AU	627465 B	27-08-1992
			AU	3725689 A	03-01-1991
			AU	4320689 A	06-02-1991
			PT	90731 A	29-12-1989
			WO	9100904 A	24-01-1991

WO 9711086	A	27-03-1997	EP	0851868 A	08-07-1998

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/02293

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO 9731115 A	28-08-1997	AU 2124697 A HR 970092 A		10-09-1997 30-04-1998
WO 9812207 A	26-03-1998	AU 4355697 A		14-04-1998